Industrial Engineering Journal
ISSN: 0970-2555
Volume : 52, Issue 4, April : 2023

HD SURVELLIANCE SPY ROBOT WITH WIRELESS NIGHT VISION CAMERA

Y.Naveen Assistant Professor, Department of ECE, Ramachandra College of Engineering
Ch.Mounika, J.Sai Deepika, P.Hema Lalitha Devi, R.Dhiswant Roshan UG Students, Department of ECE, Ramachandra College of Engineering, Eluru, A.P : mounikachedugundi@gmail.com

ABSTRACT

The main objective behind this project is to develop a robot to perform the act of surveillance human activities using wireless night vision camera and Robots can be manually controlled using Bluetooth android application. The robot consists of night vision wireless camera which can transmit videos of the human. The purpose of this robot is to roam around and provide audio and video information from the given environment and to send that obtained information to the user. In this project, one can control the robot with the help of mobile. This robot will collect data from remote place and able to send those data to a remote IoT cloud database. We can control the movement of the robot by sending instructions via Bluetooth app from our android phone. a multipurpose Robotic vehicle moves Forward, Left, Right, Backward and Stop directions at which can be constrained by Arduino In proposed system we are going to designed a low-cost Microcontroller Based Android controlled Robot. The robot will move forward, backward, left and right direction by following the instructions given from the mobile. This system can be helpful for various purposes. Our project aims to provide a robotic vehicle equipped with a wireless camera having night vision capability for remote monitoring/spying purposes. The night vision camera allows for transmitting real time night vision video even in dark environments. Whatever is recorded by the camera can be viewed in PC for reference.

1. INTRODUCTION

Our project aims to provide a robotic vehicle equipped with a wireless camera having night vision capability for remote monitoring/spying purposes. The night vision camera allows for transmitting real time night vision video even in dark environments. Whatever is recorded by the camera can be viewed in PC for reference. This system is to be useful in war, terrorism and sensitive areas. It can also be used to operate in jungles and other environments humans cannot possibly enter during the night. The vehicle can be controlled remotely by an android device for easy operation. It uses android application commands to move in front, back and left right directions. The vehicle consists of receivers interfaced to an 8051 microcontroller. On receiving command from the receiver. The 8051 microcontroller now operates the movement motor through a driver IC. The robotic vehicle can be easily operated from any android device. It provides a good user interface for handling the vehicle. The android device can operate the vehicle at a good Bluetooth communication

range. The Bluetooth receiver at the vehicle is used to transmit control movement data from app to vehicle. The night vision camera mounted on robot allows for efficient spying even in darkest areas using infrared lighting.

Cloud robotics is an emerging field that is centered on the benefits of converged infrastructure and shared services of a cloud computing environment. In this paper, a system is designed with an autonomous robot to sense environmental data such as temperature, humidity, and air quality, along with GPS coordinates and store them on the cloud. The mobile robot is controlled using an Arduino microcontroller and communicates with the cloud via a Raspberry Pi. A private cloud is set up using Open Stack that provides Infrastructure as a Service. The collected data are stored in a cloud server which could be viewed through a web browser and can be used to create awareness about the environmental changes of the location under study. A proof- of-concept prototype has been developed to illustrate the effectiveness of the proposed system. Cloud robotics is an emerging field that merges the concepts of cloud technologies and service robots. It is a disruptive technology based on the advantages of rapid fall in costs of servers, data centers, and broadband access, inexpensive cloud storage, and distributed computing. Internet is used to complement the capabilities of the robots by relieving them from on -board computation-intensive tasks and enable them to provide effective services on demand. Robotics is a technology that deals with the design, construction, operation, and application of robots, as well as computer systems for their control, sensory feedback, and information processing. The human operator may manipulate the robot from a distance by sending commands and receiving information via communication network. Robotic systems have brought significant economic and social impacts to human lives over the past few decades. Recently, robotic systems are utilized as data-gathering tools by scientists for a greater understanding of environmental processes. Robots are also being designed to explore deep oceans, to track harmful algal blooms, monitor climatic condition ns, and to study about remote volcanoes. Cloud is a service provider that provides services such as infrastructure, software or resources. Infrastructure as a Service (IaaS) models an organization that outsources the resources required for its operations, including storage and networking components. While the cloud computing paradigm was originally developed in the cyber world and applied software as a service (SaaS), in the last few years it has been extended to the cyber-physical world, including vehicles like cars and people with smart phones, and robots like ground vehicles and unmanned aerial vehicles. Recently, researchers have started to merge cloud computing concepts with mobile robotics, e.g... This approach has been particularly useful in the context of computation intensive applications like image processing and cognition needed by mobile robots as these tasks take up space, power, and incur high costs. The cost and complexity of performing the basic functionalities such as sensing, actuation, and control in a single robot increases exponentially.

2. LITERATURE SURVEY

Robot navigation problems can be generally classified as global or local, depending upon the

environment surrounding the robot. In global navigation, the environment surrounding the robot is known and a path which avoids the obstacles is selected. In one example of the global navigation techniques, graphical maps which contain information about the obstacles are used to determine a desirable path. In local navigation, the environment surrounding the robot is unknown, or only partially known, and sensors have to be used to detect the obstacles and a collision avoidance system must be incorporated into the robot to avoid the obstacles. The artificial potential field approach is one of the well-known techniques which have been developed for this purpose. Krogh, for example, used a generalized potential field approach to obstacle avoidance. Kilm and Khosla used instead harmonic potential functions for obstacle avoidance. On the other hand, Krogh and Fang used the dynamic generation of sub goals using local feedback information. [5] During the past few years, potential field methods (PFM) for obstacle avoidance have gained increased popularity among researchers in the field of robots and mobile robots. The idea of imaginary forces acting on a robot has been suggested by Andrews and Hogan and Khatib. In these approaches' obstacles exert repulsive forces onto the robot, while the target applies an attractive force to the robot. The sum of all forces, the resultant force R, determines the subsequent direction and speed of travel. One of the reasons for the popularity of this method is its simplicity and elegance. [6] This paper introduces histogram in-motion mapping (HIMM), a new method for real-time map building with a mobile robot in motion. HIMM represents data in a two-dimensional array, called a histogram grid that is updated through rapid in motion sampling of onboard range sensors. Rapid in-motion sampling results in a map representation that is well-suited to modeling inaccurate and noisy range-sensor data, such as that produced by ultrasonic sensors, and requires minimal computational overhead. Fast map-building allows the robot to immediately use the mapped information in real-time obstacle-avoidance algorithms. The benefits of this integrated approach are twofold: (1) quick, accurate mapping; and (2) safe navigation of the robot toward a given target.

[7] Real-time obstacle avoidance is one of the key issues to successful application of mobile robot systems. All mobile robots feature some kind of collision avoidance, ranging from primitive algorithms that detect an obstacle and stop the robot short of it in order to avoid a collision, through sophisticate algorithms, that enable the robot to detour obstacle. The later algorithms are much more complex, since they involve not only the detection of an obstacle, but also some kind of quantitative measurements concerning the obstacle's dimensions. In our system the ultrasonic sensors are continuously sampled while the robot is moving. If an obstacle produces an echo, the corresponding cell contents are incremented. A solid, motionless obstacle eventually causes a high count in the corresponding cells. Misreading, on the other hand, occur randomly, and do not cause high count in any particular cell. These methods yield a more reliable obstacle representation in spite of the ultrasonic sensor's inaccuracies. [8]. Many definitions of the Internet of Things exist, but at the most fundamental level it can be described as a network of devices interacting with each other

Industrial Engineering Journal
ISSN: 0970-2555
Volume : 52, Issue 4, April : 2023

via machine to machine (M2M) communications, enabling collection and exchange of data [9], [10], [11]. This technology enables automation within a large range of industries, as well as allowing for the collection of big data. Hailed as the driver of the Fourth Industrial Revolution [12], Internet of Things technology has already found commercial use in areas such as smart parking [14], precision agriculture and water usage management. Extensive research has also been conducted into the use of IoT for developing intelligent systems in areas including traffic congestion minimization structural health monitoring crash-avoiding cars, and smart grids. While the aforementioned fields appear vastly different to healthcare, the research conducted within them verifies the plausibility of an IoT-based healthcare system.

3. EXISTING SYSTEM

In the present existing system there is manual things of operations going due to that no faster the applications and cost effective. To make automation we're introducing the robot. This proposed robot will be controlled via manually. We can control the movement of the robot by sending instructions via Bluetooth app from our android phone. a multipurpose Robotic vehicle moves Forward,Left,Right,Backward and Stop directions with night vision spy camera. The existing system has used the 8051 micro controller and Arduino board in order to design the robot. Here we use 8052 series micro controller (AT89C52).

4. PROPOSED SYSTEM

Our project aims to provide a robotic vehicle equipped with a wireless camera having night vision capability for remote monitoring/spying purposes. The night vision camera allows for transmitting real time night vision video even in dark environments. Whatever is recorded by the camera can be viewed in PC for reference. The block diagram of IoT based firefighting robot is shown by fig.1, which consists of plurality of sensors, Arduino Uno, dc motor and ESP-32 WIFI Camera module. Power offer could be a regard to supply of electricity. A device which provides electricity or different kinds of power to drive an output load or various number of installed components. The supply is mostly ordinarily injected to voltage consuming component, less typically to mechanical parts, and barely other parts. In this device a 12V DC power is offer to all electronics related component. For this purpose, there is a requirement to step down electrical device, rectifier, transformer, and filter circuit for smoothing generated 12V DC power

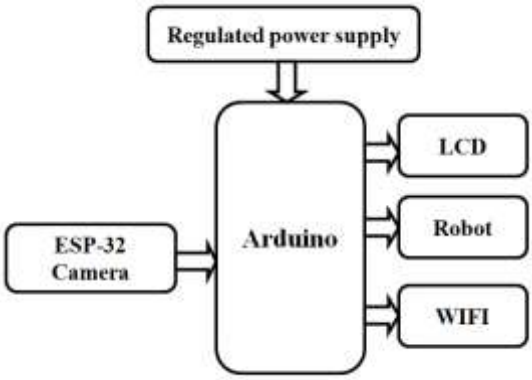

Fig.1. Proposed block diagram

WORKING MODEL:

This is the block diagram for the HD Surveillance SPY Robot with Wireless Night Vision Camera. Here we are using different

Industrial Engineering Journal
ISSN: 0970-2555
Volume : 52, Issue 4, April : 2023

types of Modules likeESP-32 Camera, LCDmonitor, Regulated Power Supply, Robot, WIFI. The ,Regulated Power Supply is used to give the power supply to the whole circuit it can convert the 230 voltage of AC to12 voltage of DC.The voltage regulated power supply(7805) can convert the 12v to 5 volts The input of this Block diagram is ESP-32 CAMERA It has internally connected with the WIFI module. It can capture the pictures with 0.5 pixel Camera, the power supply has been given by Regulated power supply the camera having four pins internally it is connected to the motor1 and motor2(l293 motor) with the help of the controller The output of the Block diagram is LCD as screen it can acts as a panel to control the robot towards and backwards Robot It is acted as a motor with 100 RPM DC motor 1 and 100 Rpm DC motor 2 these are connected with two wheels to move frontwards,backwards,Left and Right and it has free wheel too move in any direction with force

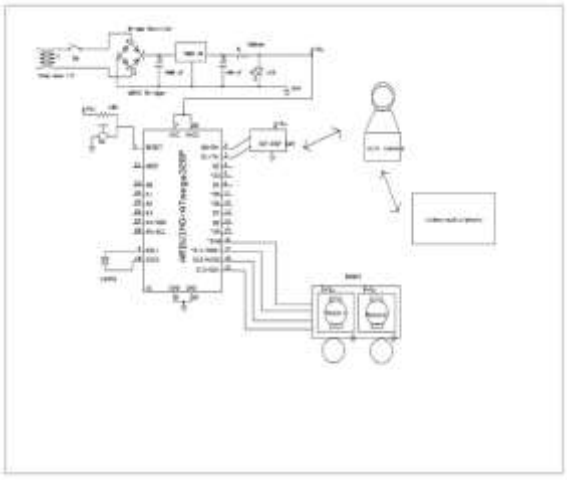

Fig.2. Proposed Circuit diagram

This is the pin diagram where all the hardware components are been connected components. The step down transformer ,Bridge rectifier capacitor with 1000f Resisters and led are connected in Regulated power supply audio with 13 analog and digital pins WIFI is connected through camera The motor 1 and motor 2 has connected with audio as D10,D11,D12,D13 WIFI has connected to D0,D1. Monitor has connected with the D2, D3, D4, D5, D6, and D7. 8 and 22 pins are connected to Ground 7and 20 pins are connected to VCC and AVCC 1 as RESET.

5. RESULTS

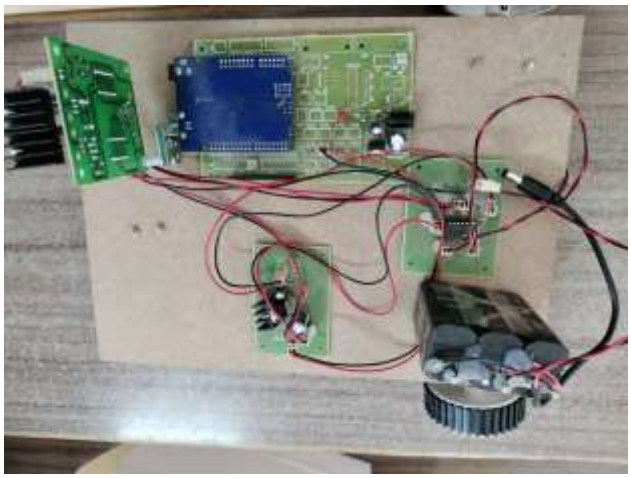

Fig.3. Proposed Output model

When the power is on the LED on the Arduino gets on and blink red colour. And the LCD gets on and displaysthe title of the project which is IOT garbage collector. And LED on IOT module also blinks which is used to pass the data to the server.The above picture shows the HD SURVEILLANCE SPY ROBOT WITH NIGHT VISION CAMERA here Regulated power supply acts as a power supply to the whole modules like ESP-32 CAM,ROBOT,WIFI,LCD MONITOR.Aurdino we can dumb the language in embedded c ESP-32 CAM has 0.5 pixel to capture the things around us with internally connected WIFI

Industrial Engineering Journal
ISSN: 0970-2555
Volume : 52, Issue 4, April : 2023

to move the panel with frontwards backwards left and right .Capacitance it can reduce the noice It has two motors as wheels to move the directions with force and it is a live streaming program as well it is connected to our android with WIFI application as network scanner

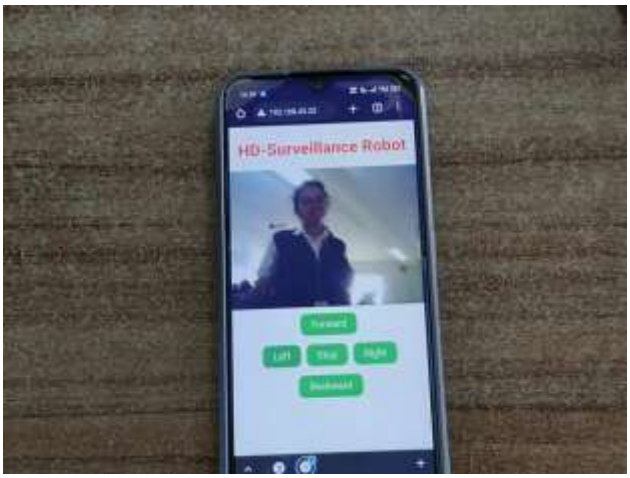

Fig.4. LCD Output Indication

Here the picture is capturing from the HD SURVEILLANCE SPY ROBOT, there is left right forward backward are the directions with thaw WIFI along 100 meters distance it can applicable for the JUNGLES, MILITARY, WAR FIELDS where manual cannot work It can provide a live streaming program where man cannot work in night vision camera We can monitor with the our android and transmitting the real time night vision video even in dark environments

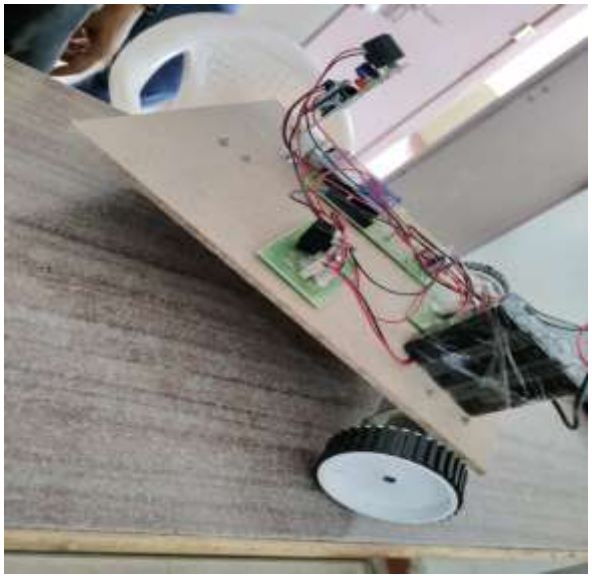

Fig.5. Output Robot Tracking

Table.1 Results comparison Table

Parameter	Existing Model	Proposed Model
Microcontroller	8051	Arduino
Speed	Low	High
Complexity	High	Low
Efficiency	LOW	HIGH

6. CONCLUSION

We designed a low-cost Microcontroller Based Android controlled Robot. The robot will move forward, backward, left and right direction by following the instructions given from the mobile with video surveillance system using night vision camera. This robot is controlled by Bluetooth module with left, right, forward and backwards positions through android phone. This system can be helpful for various purposes. In this paper, we have proposed a design of a smart cloud robot to monitor the environmental condition of a remote place. A prototype has

been developed and tested in our campus to illustrate the effectiveness of the proposed.

REFERENCES

[1] Muhammad Hamza, M Atique-ur-Rehman, HamzaShafqat, Subhan Bin Khalid, "CGI SCRIPT AND MJPG VIDEO STREAMER BASED SURVEILLANCE ROBOT USING RASPBERRY PI" in 16th International Bhurban Conference on Applied Sciences & Technology (IBCAST) Islamabad, Pakistan, 8th – 12th January, 2019, IEEE 2019.

[2] Juan G. Parada-Salado, Luis E. Ortega-García, Luis F. Ayala-Ramírez, Francisco J. Pérez Pinal, "A Low-Cost Land Wheeled Autonomous MiniRobot For In-Door Surveillance" In Ieee Latin America Transactions, Vol. 16, No. 5, May 2018.

[3] S M Ashish, MadhuryaManjunath, Ravindra L, Mohammed Nadeem, Neelaja K, "Automated Hybrid Surveillance Robot" In International Journal Of Innovations In Engineering Research And Technology [Ijiert], Issn: 2394-3696; Volume 5, Issue 5, May-2018.

[4] T. Saravanakumar, D. Keerthana, D. Santhiya, J. Sneka, D. Sowmiya, "Surveillance Robot Using Raspberry Pi-IoT" in International Journal of Electronics, Electrical and Computational System(IJEECS);ISSN 2348-117X; Volume 7, Issue 3, March 2018.

[5] Harshitha R, Muhammad HameemSafwatHussain, "SURVEILLANCE ROBOT USING RASPBERRY PI AND IOT" in 2018 IEEE - DOI 10.1109/ICDI3C.2018.00018; International Conference on Design Innovations for 3Cs Compute Communicate Control.

[6] Gaurav S Bagul, Vikram C Udawant, Kalpana V Kapade and Jayesh M Zope, "IOT BASED SURVEILLANCE ROBOT" in International Journal of Trend in Research and Development, Mar - Apr 2018; Volume 5(2), ISSN: 2394-9333.

[7] Rutuja. R. Bachhav, Priyanka. S. Bhavsar, Devyani. K. Dambhare, "Spy Robot For Video Surveillance And Metal Detection" In International Journal For Research In Applied Science & Engineering Technology (Ijraset); Issn: 2321-9653; Volume 6 Issue V, May 2018.

[8] NehaJoisher, Sonaljain, TejasMalviya, VaishaliGaikwad (Mohite), "Surveillance System Using Robotic Car" In International Conference on Control, Automation and Systems, IEEE 2018.

[9] FatmaSalih, Mysoon S.A. Omer, "Raspberry Pi as A Video Server" In the International Conference on Computer, Control, Electrical, and Electronics Engineering (Icccеee) 2018.

[10] SweetaDeshmukh, Priyadarshini, Mamta, MadhuraDeshmukh, Dr.Md. Bakhar, "IoT Based Surveillance Robot" In International Journal Of Innovative Research In Computer And Communication Engineering; Vol.5, Special Issue 4, June 2017

[11] Ghanem Osman ElhajAbdalla, T. Veeramanikandasamy, "Implementation Of Spy Robot For A Surveillance System Using Internet Protocol Of Raspberry Pi" In 2nd Ieee International Conf On Recent Trends In Electronics Information & Communication Technology, May 19-20, 2017.

[12] SouvikSaha, Arko Singh, PalashBera, Murshed Nawaz Kamal, SoumyaDutta, UttamGorian, SayakPramanik, Angshuman Khan, Surajit Sur, "Gps Based Smart Spy Surveillance Robotic System Using Raspberry Pi For Security Application And Remote Sensing" In Ieee , 978-1-5386- 3371-7/17,2017.